

CLAIMS

1. An electro-mechanical screw actuator assembly, of the type comprising:

a housing (11) fixable to a motor vehicle,  
an electric motor (30) mounted within the housing (11) and comprising a stator (31) fixed to the housing (11) and a rotor (34),

a screw mechanism (60), including a rotatable nut (61) and a central screw (62) translatable along a given axis (x),  
gear reduction means (50) disposed between the rotor (34) and the screw mechanism (60) for provoking a translation of the screw (62),

characterized in that the housing (11) is secured to or integral with a supporting element (21) of essentially tubular cylindrical shape extending within the housing (11) coaxial to said axis (x), wherein the supporting element (21)

externally, rotatably supports the rotor (34) of the electric motor (30), and

internally, rotatably supports the nut (61) of the screw mechanism (60).

2. An actuator assembly according to claim 1, characterized in that the supporting member (21) forms an axial cavity (24) for accommodating and axially guiding a piston member (70) fixed to or integral with the screw (61) of the screw mechanism (60).

3. An actuator assembly according to claim 1, characterized in that at the interface between the axial cavity (24) of the supporting member (21) and the piston member (70) there is provided an axial splined coupling or a form coupling (26) for preventing rotation of the screw (62) and/or the piston

member (70) with respect to the housing (11).

4. An actuator assembly according to claim 1, characterized in that the supporting member (21) is formed by a rigid body (20) having also a supporting means (23) for mounting the stator (31) of the electric motor (30).

5. An actuator assembly according to claim 1, characterized in that the supporting member (21) supports externally at least one fixed gear (55) of the gear reduction means (50).

6. An actuator assembly according to claim 1, characterized in that the gear reduction means (50) include a planetary gear reduction system.

7. An actuator assembly according to claim 6, characterized in that the rotor (34) forms a radial flange (36) that serves as a carrier for a plurality of satellite gears (52).

8. An actuator assembly according to claim 7, characterized in that each of the satellite gears (52) has two toothed portions (53, 54), of which:

- a first toothed portion (53) meshes with a fixed gear (55) fast with the tubular supporting member (21) and
- a second toothed portion (54) meshes with a gear (56) fast for rotation with the nut (61).

9. An actuator assembly according to claim 1, characterized in that the screw mechanism (60) is rotatably supported at an end thereof by an angular contact ball bearing (44).

10. An actuator assembly according to claim 9, characterized in that the radially outer raceway of the angular contact

ball bearing (44) is formed at least partially by a sleeve member (45) axially locked onto the housing (11).

11. An actuator assembly according to claim 10, characterized in that the sleeve member (45) is axially locked onto the housing (11) by cold forming an end portion (47') of the sleeve member (45) deformed in a radially outer direction against a radial wall (14) of the housing (11).

12. An actuator assembly according to claim 10, characterized in that the radially outer raceway of the angular contact for bearing (44) is formed entirely by a sleeve member (45), whilst the radially inner raceway is formed partly by the nut (61) and partly by a separate annular member (48') axially locked (49') onto the nut.

13. An actuator assembly according to claim 12, characterized in that the separate annular member (48') is axially locked onto the nut (61) by cold forming an end portion (61') of the nut that is deformed in a radially outer direction against a radial wall of the separate ring (48').

14. An actuator assembly according to claim 1, characterized in that the screw mechanism (60) includes a ballscrew.

15. An actuator assembly according to anyone of the preceding claims, characterized in that it is coupled with a brake caliper (A) for operating a braking force on a motor vehicle.